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ber, and, with the pulse-rate full, there is ordinarily less blood in the brain.

Now, it is evident that the anæmia of sleep is not caused by constricted blood-vessels, else there would be the facial pallor seen during an attack of epilepsy, or paroxysm of anger or fright; and with this quieting of the brain-processes by stimuli withdrawal, such as is afforded by darkness, silence, and absence of irritation generally, a further lessening of molecular interchange in the brain occurs; and, I claim that it is the molecular activity in the brain that attracts the blood there chemically and mechanically, and the sympathetic, or vaso-motor system has evolved to facilitate this regulation of demand and supply. Then, granting this, there will be, during sleep, a passive condition of the blood-vessels, and the blood supply will fall to a minimum.

An extension of these considerations will enable all that pertains to sleep to be accounted for, such as æstivation, hibernation, insomnia, dreams, and all derangements of sleep. I hope soon to be able to treat this subject more fully.

S. V. CLEVENGER.

Chicago, Oct. 15.

Solid Glycerine.

IN response to the inquiry of Mr. C. C. Smith regarding the solidification of glycerine, I would say: A mixture of glycerine with water can be frozen at a sufficiently low temperature, and this temperature must be the lower proportionately as the percentage of glycerine is high. Thus, a ten per cent glycerine solution solidifies at -1°C ., a twenty per cent solution at -2.5°C ., a forty per cent solution at -17.5°C .

Concentrated glycerine will not crystallize when cooled quickly, but at -40°C . will solidify to a gum-like mass. If a concentrated solution be allowed to stand for some time at 0°C . crystals may form, but not always. The melting-point of these crystals, which are extremely hygroscopic, has been variously determined; and, indeed, their form of crystallization is much in dispute.

Two cases are reported of glycerine having become solidified and crystallized during transport in the cold of winter. The first case occurred in January, 1867, the crystals formed being described as small octohedral, melting at 7.2°C . In the second case, 1876, the crystals are described as belonging to the monoclinic system, and melting at 15°C .

According to Werner, commercial glycerine may be crystallized by bubbling chlorine-gas through it. A method discovered by Kraut in 1870, but to the best of my knowledge not yet made public, is used on a commercial scale in the works at Liesing, near Vienna. The concentrated glycerine is cooled to 0°C ., and maintained at that temperature for some time, when crystals of glycerine previously produced are introduced. This causes a crystallization of the entire mass, leaving, however, much of the impurity in the mother liquor. The mass is then placed in a centrifugal, and the crystals freed. These are described as monoclinic, melting at 20°C . to glycerine of 30.5°B . According to Von Lang, the crystals are orthorhombic.

CHARLES PLATT, A.C.

The Vandenberg Laboratory, Buffalo, Nov. 8.

BOOK-REVIEWS.

Crania Ethnica Americana. Sammlung Auserlesener Amerikanischer Schädeltypen. Herausgegeben von RUDOLF VIRCHOW. Mit 26 Tafeln und 29 Text-Illustrationen. Large 4to. Berlin, A. Asher & Co., 1892. 36 marks.

SINCE the publication of Dr. Morton's "Crania Americana," now more than half a century ago, there has been no contribution to American craniology at all comparable to this work by the acknowledged master of that science in Germany. Future investigators will undoubtedly follow the lines and be guided by the principles here laid down or suggested. Let us briefly see what these are.

CALENDAR OF SOCIETIES.

Biological Society, Washington.

Nov. 5.—C. Hart Merriam, The Fauna and Flora of Roan Mountain, N.C.; C. V. Riley, Pea and Bean Weavils; Vernon Bailey, The Influence of the Cross Timbers on the Fauna of Texas; Theobald Smith, On Certain Minute (Parasitic?) Bodies Within the Red Blood Corpuscles.

New Mexico Society for the Advancement of Science, Las Cruces, New Mexico.

Nov. 3.—J. P. Owen, Notes on the Mound Builders; C. H. Tyler Townsend, A Partial Comparison of the Insect Fauna of the Grand Cañon with that of the San Francisco Mountain, in Arizona; Arthur Goss, The Exhaustion and Renewal of Soils; C. T. Hagerty, Mathematical Computation of the Comparative Strength of Insects and the Higher Animals.

Publications Received at Editor's Office.

BUBIER, E. T. 2nd. Questions and Answers About Electricity. New York, D. Van Nostrand Co. 16 $\frac{1}{2}$ p. Ill. 50 cts.
CHURCH, ALFRED J. Stories from the Greek Comedians. New York, Macmillan & Co. 12 $\frac{1}{2}$ p. Ill. \$1.
CROCKER, F. B. AND WHEELER, S. S. The Practical Management of Dynamo and Motors. New York, D. Van Nostrand Co. 12 $\frac{1}{2}$ p. Ill. \$1.
FERREE, BARR. Comparative Architecture. New York, The Author. 8 $\frac{1}{2}$ p. Paper. 15 p.
GALTON, FRANCIS. Hereditary Genius. 2d ed. New York, Macmillan & Co. 8 $\frac{1}{2}$ p. \$2.50.
HORN, ARTHUR H. Metal Coloring and Bronzing. New York, Macmillan & Co. 16 $\frac{1}{2}$ p. \$1.
HUDSON, W. H. The Naturalist in La Plata. London, Chapman & Hall. 8 $\frac{1}{2}$ p. \$3.
SLOANE, T. O'CONNOR. The Standard Electrical Dictionary. New York, Norman W. Henley & Co. 12 $\frac{1}{2}$ p. 624 p. \$3.
SPEAR, MARY A. Leaves and Flowers. Boston, D. C. Heath & Co. 12 $\frac{1}{2}$ p. 103 p. 30 cts.
UNIVERSITY OF PENNSYLVANIA. Contributions from the Botanical Laboratory. Phila., The University. 8 $\frac{1}{2}$ p. Paper. 72 p. Ill.

Exchanges

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Reading Matter Notices.

Ripans Tabules: for torpid liver.

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The American Geologist for 1892.

Edited by PROF. S. CALVIN, University of Iowa; DR. E. W. CLAYPOLE, Buchtel College; JOHN EYERMAN, Lafayette College; DR. PERSIFOR FRAZER, Penn. Hort. Soc.; PROF. F. W. CRAGIN, Colorado College; PROF. ROBT T. HILL, U. S. Irrigation Survey; DR. ANDREW C. LAWSON, University of California; R. D. SALISBURY, University of Wisconsin; JOSEPH B. TYRRELL, Geol. Sur. of Canada; E. O. ULRICH, Minnesota Geological Survey; PROF. I. C. WHITE, University of West Virginia; PROF. N. H. WINCHELL, University of Minnesota. Now in its IXth volume. \$3.50 per year. Sample copies, 20 cents. Address

THE GEOLOGICAL PUBLISHING CO., Minneapolis, Minn.

Dr. Virchow aims in the first place to establish a series of cranial ethnic types as the foundation of ethnic classification. Here, very much depends on the sense in which a "type" is understood. For him, it is the sum of those traits which belong to the crania of a given ethnic division, excluding, on the one hand, traits which are individual, and, on the other, those which are generic. Theoretically, it is the expression of the ethnic law of hereditary development, which, independently of outward circumstances, controls bodily growth. It must be defined by a series of exclusions and averages.

Each of the "types" which he figures is represented with the utmost fidelity in five different positions, showing the following norms: norma frontalis, occipitalis, temporalis, verticalis, and basilaris. All are represented from the points of view of the "German horizontal," which is a line drawn from the superior point of the external auditory foramen to the lower margin of the ocular cavity. This method of iconography is in itself worth a particular study, and no exception can be taken to its accuracy and its superiority to those heretofore in use.

Close attention is given to artificial deformations of the skull, which were numerous and widespread among the American aborigines. Eight leading varieties are classified and their effects analyzed. It is shown that by laws of compensatory growth such deformity does not entail diminished cubical capacity. The lowest capacity, 1,100 cubic centimeters, was in a normal skull from Chile; the highest, 1,880 cubic centimeters, was in a Labrador Eskimo.

The general conclusions reached by this masterful study will interest every one. In the first place, Dr. Virchow denies that there is any one characteristic aboriginal American type of skull, or, so far as one can see, that there ever has been one. The salient traits, none of which is peculiar to the race, are the os Incae, which is an arrest of development; the absence of the temporal process, the presence of which is a pithecoïd trait; exostosis of

the meatus auditorius, which must be regarded as pathological; and certain changes in the alveolar and malar bones, largely due to function. Finally, the conclusion is reached that the lowest known forms of the human skull have no counterparts in any yet discovered in America, and therefore we must at present draw the inference that such types did not exist there, and that the oldest history of the human species will not be enlightened by any discoveries in the New World. Man came to America as an immigrant, physically highly developed, and doubtless in a condition of culture corresponding thereto.

This brief outline gives but a faint idea of the riches offered in Dr. Virchow's introduction, which is written, moreover, in that lucid and vigorous style of which he is such a master, and which is in such happy contrast to most German scientific composition. There are, however, a few points where the work is open to question. The reference on the first page to the inferior value of linguistic grouping carries with it its own condemnation; for where there is mixture of languages there is invariably mixture of blood, and hence of cranial types as well. Bones cannot guide us better than roots in such interminglings. In several of his "types" the history is sadly incomplete. Thus, Plate xv. shows a "Mexican" skull; but to say "Mexican" is every whit as vague as to say "European;" and what guarantee have we that its peculiarities are not individual instead of ethnic? This observation applies to several other of the crania figured. According to his own definition of type, such specimens can have but very doubtful value. In the text to Table xx. it is assumed that a prominent frontal protuberance is a proof that the skull belonged to a male. Do other anatomists concede this? But criticism is disarmed by the candid statement of the author that the material at hand was far from sufficient to reach the point he desired, and that his work must be regarded rather as a preliminary contribution to the study of this wide and important field. This it is, in the best sense of the word.

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Much pains has been taken to render the bibliography complete, and the author is indebted to Dr. Franz Boas and others for several titles and important suggestions; and it is hoped that this feature of the book will recommend it to collectors of *Americana*.

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